1-18. (Canceled)

19. (Original) A machine readable medium that provides instructions, which when executed by a set of processors, cause said set of processors to perform operations comprising:

transmitting a first tunnel control message for Layer 2 Tunneling Protocol (L2TP) tunnel setup having an attribute value pair (AVP) indicating Ethernet frame capability, receiving a second tunnel control message for L2TP tunnel setup having an AVP indicating Ethernet frame capability;

transmitting a session control message having an AVP indicating an L2TP Ethernet session and an AVP indicating an Ethernet Media Access Control (MAC) address; and

transmitting an Ethernet frame with the L2TP Ethernet session.

20. (Original) The machine readable medium of claim 19 further comprising performing session fail retry before transmitting the Ethernet frame.

21. (Original) The machine readable medium of claim 19 wherein transmitting the first and second tunnel control messages comprises manipulating the bits of the first and second tunnel control messages.

22. (Canceled)

23. (Previously Presented) The machine readable medium of claim 24 wherein the tunnel is non-homogenous.

24. (Previously Presented) A machine readable medium that provides instructions, which when executed by a set of processors, cause said set of processors to perform operations comprising:

establishing an Ethernet capable Layer 2 Tunneling Protocol (L2TP) tunnel, wherein establishing the Ethernet capable L2TP tunnel comprises,

        receiving a first tunnel control message indicating Ethernet capability; and

        transmitting a second tunnel control message indicating Ethernet frame capability;

    accepting an L2TP session;

    receiving an L2TP encapsulated Ethernet frame over the session;

    decapsulating the Ethernet frame; and

    associating the Ethernet frame to a virtual circuit structure.

25. (Canceled)

26. (Previously Presented) The machine readable medium of claim 24 further comprising extracting a set of data from the Ethernet frame.

27. (Canceled)

28. (Original) A machine readable medium that provides instructions, which when executed by a set of processors, cause said set of processors to perform operations comprising:

    receiving a first Layer 2 Tunneling Protocol tunnel control message having an attribute value pair (AVP) indicating Ethernet capability;

    transmitting a second L2TP tunnel control message having an AVP indicating Ethernet capability;

    receiving a session control message having an AVP indicating a session type and an Ethernet MAC address;

    creating a virtual circuit structure for the session type in response to the session control message; and

    processing an L2TP packet having a payload with the virtual circuit structure.

29. (Original) The machine readable medium of claim 28 wherein processing the L2TP packet comprises:

decapsulating the payload from the L2TP packet; and

processing the payload as indicated by the virtual circuit structure.

30. (Original) The machine readable medium of claim 28 wherein the first and second control messages include values requested by a customer.

31. (Canceled)

32. (Previously Amended) The machine readable medium of claim 34 wherein the L2TP tunnel is non-homogenous.

33. (Canceled)

34. (Previously Presented) An apparatus comprising:

a Layer 2 Tunneling Protocol (L2TP) Access Concentrator (LAC) to transmit an Ethernet frame over an L2TP tunnel, wherein the LAC to transmit the Ethernet frame comprises,

establishing an L2TP tunnel capable of carrying an Ethernet over L2TP session; and

establishing an Ethernet over L2TP session to an Layer 2 Tunneling Protocol Network Server (LNS), wherein establishing the tunnel capable of carrying an Ethernet over L2TP session comprises,

the LAC transmitting a first tunnel control message to the LNS indicating Ethernet frame capability, and

the LNS transmitting a second tunnel control message to the LAC indicating Ethernet frame capability;

the LNS to receive the Ethernet frame from the L2TP tunnel originating at the LAC.

35. (Currently Amended) The apparatus of claim 34 wherein the establishing the Ethernet over L2TP session to the LNS comprises the LAC transmitting to the LNS a session control message indicating Ethernet encapsulation and an Ethernet Media Access Control (MAC) address for the LAC.

36. (Canceled)

37. (Currently Amended) The LAC of claim [[36]] 39 wherein to establish the Ethernet over L2TP session comprises transmitting signals, the signals including requested values.

38. (Currently Amended) The LAC of claim [[36]] 39 wherein the tunnel is non-homogenous.

39. (Currently Amended) A Layer 2 Tunneling Protocol (L2TP) Access Concentrator (LAC) comprising The LAC of claim 36 wherein to establish the Ethernet capable L2TP tunnel comprises:

an operating system to establish an Ethernet capable L2TP tunnel with a peer, to perform session fail retry;

to establish an Ethernet over L2TP session in the tunnel, to encapsulate an Ethernet frame with L2TP, wherein the establish the Ethernet over L2TP session in the tunnel comprises:

transmitting a first tunnel control message indicating Ethernet frame capability; and

receiving a second tunnel control message indicating Ethernet frame capability; and

a circuit to transmit the session.

40. (Currently Amended) The LAC of claim [[36]] wherein to establish the Ethernet over L2TP session in the tunnel comprises transmitting a session control message indicating Ethernet encapsulation and an Ethernet MAC address for the LAC.

41. (Canceled)

42. (Currently Amended) The LNS of claim 41 43 wherein the tunnel is non-homogenous.

43. (Previously Presented) A Layer 2 Tunneling Protocol (L2TP) Network Server (LNS) comprising:

an operating system to establish an Ethernet capable L2TP tunnel, wherein the operating system to establish the Ethernet capable L2TP tunnel comprises,

receiving a first tunnel control message indicating Ethernet capability; and

transmitting a second tunnel control message indicating Ethernet capability;

a circuit to receive an Ethernet over L2TP packet having an Ethernet frame as a payload; and

a logic to process the packet.

44-47. (Canceled)

48. (Original) A computer implemented method comprising:

transmitting a first tunnel control message for Layer 2 Tunneling Protocol (L2TP) tunnel setup having an attribute value pair (AVP) indicating Ethernet frame capability,

receiving a second tunnel control message for L2TP tunnel setup having an AVP indicating Ethernet frame capability;

transmitting a session control message having an AVP indicating an L2TP Ethernet session and an Ethernet Media Access Control (MAC) address; and

transmitting an Ethernet frame with the L2TP Ethernet session.

49. (Original) The method of claim 48 further comprising performing AAA retry before transmitting the Ethernet frame.

50. (Original) The method of claim 48 wherein transmitting the first and second tunnel control messages comprises manipulating the bits of the first and second tunnel control messages.

51-62. (Canceled)

63. (Previously Presented) A method comprising:

transmitting a first tunnel control message for Layer 2 Tunneling Protocol (L2TP) tunnel setup having an attribute value pair (AVP) indicating Ethernet frame capability, receiving a second tunnel control message for L2TP tunnel setup having an AVP indicating Ethernet frame capability;

transmitting a session control message having an AVP indicating an L2TP Ethernet session and an AVP indicating an Ethernet Media Access Control (MAC) address; and

transmitting an Ethernet frame with the L2TP Ethernet session.

64. (Previously Presented) The method of claim 63, further comprising performing session fail retry before transmitting the Ethernet frame.

65. (Previously Presented) The method of claim 63, wherein transmitting the first and second tunnel control messages comprises manipulating the bits of the first and second tunnel control messages.

66. (Previously Presented) A method comprising:

establishing an Ethernet capable Layer 2 Tunneling Protocol (L2TP) tunnel, wherein establishing the Ethernet capable L2TP tunnel comprises:

receiving a first tunnel control message indicating Ethernet capability; and

transmitting a second tunnel control message indicating Ethernet frame capability;

accepting an L2TP session;

receiving an L2TP encapsulated Ethernet frame over the session;

decapsulating the Ethernet frame; and

associating the Ethernet frame to a virtual circuit structure.

67. (Previously Presented) The method of claim 66, wherein the tunnel is non-homogenous.

68. (Previously Presented) The method of claim 66, further comprising extracting a set of data from the Ethernet frame.

69-74. (Canceled)

75. (Previously Presented) A method comprising:

receiving a first Layer 2 Tunneling Protocol tunnel control message having an attribute value pair (AVP) indicating Ethernet capability;

transmitting a second L2TP tunnel control message having an AVP indicating Ethernet capability;

receiving a session control message having an AVP indicating a session type and an Ethernet MAC address;

creating a virtual circuit structure for the session type in response to the session control message; and

processing an L2TP packet having a payload with the virtual circuit structure.

76. (Previously Presented) The method of claim 75, wherein processing the L2TP packet comprises:

decapsulating the payload from the L2TP packet; and

processing the payload as indicated by the virtual circuit structure.

77. (Previously Presented) The method of claim 75, wherein the first and second control messages include values requested by a customer.